CASES ILLUSTRATING VARIOUS FORMS OF HEMIANOPSIA AND OTHER IRREGULARITIES IN THE FIELD OF VISION.

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IN the JOURNAL OF NERVOUS AND MENTAL DISEASE for January, 1886, Dr. E. C. Seguin contributed an important paper entitled, "A Contribution to the Pathology of Hemianopsia of Central Origin (Cortex Hemianopsia);" important because the conclusions there formulated were based only upon post-mortem determination. In the same Journal for August, 1886, there is another paper from the pen of Dr. Seguin, entitled, "A Clinical Study of Lateral Hemianopsia," in which nine cases of this affection without post-mortem determinations are recorded. In it Dr. Seguin remarks, "The state of our knowledge is such as to render every new case of lateral hemianopsia with autopsy of extreme interest and scientific value; yet it does not, I think, render quite useless the publication of cases without post-mortem study. A number of points in the clinical history and symptom-grouping of hemianopsia may be illustrated by such cases and the diagnosis *intra vitam* of other cases facilitated." Somewhat in the same spirit I bring before you to-night these cases which illustrate various forms of hemianopsia as well as other irregularities in the fields of vision.

CASE I.—Daniel G., æt. 40. Patient of Dr. H. C. Wood, in the Nervous Wards of the University Hospital. Until eight years ago health was good; he was then attacked with pains in the legs which were said to be rheumatic, and which gradually grew worse until the power of his lower limbs was lost. He has had three attacks of

morbid sleep, the last one of which began in May, 1885, and continued until the following September. During this time he lay motionless, with his eyes closed and occasionally for days at a time apparently entirely unconscious. Usually he could be aroused, but would quickly return to his somnolent state. In September he awakened, and then violent frontal and occipital headaches and spells of vomiting were the marked features of the case. Under enormous doses of iodide of potash and mercury the general condition improved, but when he left the hospital in November his headaches remained.

Examination.—A large-framed man, with pallid un-

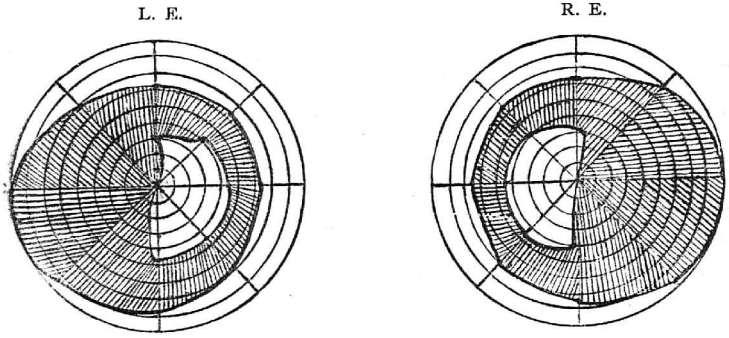

FIG. 1, CASE I.—Bitemporal hemianopsia. The outer boundary of shading represents the limits of the normal field; the shading where vision was lost.

healthy skin. Intellectual faculties good. No paralyses, but the gait labored, like that of a tired man. Vision in each eye ½; both optic nerves gray, with shallow atrophic excavations. There was typical *bilateral temporal hemianopsia* with concentric limitation of the preserved fields. The dividing line almost touched the fixing point, but above this inclined to the right, while below it inclined to the left.

Diagnosis.—As far as our present knowledge goes, this form of hemianopsia can only be produced by a lesion of the optic chiasm in its anterior or posterior angles. The patient denied all venereal history, but in spite of this the lesion was probably a syphilitic deposit, otherwise he

would have been unable to take the enormous doses of antisyphilitic remedies which were given, taken, moreover, as they were, with distinct benefit to himself.

CASE II.— ———, aged about 55, colored. A patient under the care of Dr. H. C. Wood, in the Nervous Wards of the Philadelphia Hospital. I am unacquainted with his previous history, except that he had syphilis.

Examination.—He had epileptic attacks, Jacksonian in type, partial loss of hearing on side, demonstrable loss of taste and smell, partial hemianæsthesia and hemiplegia. Pupils were of medium size and sluggish in action. Vision, in right eye, counts fingers; in the left eye, only light percep-

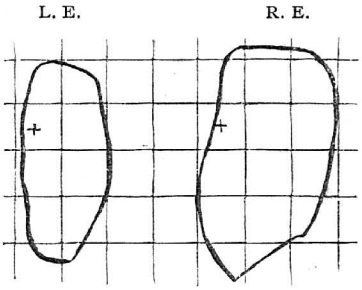

FIG. 2, CASE II.—Bilateral temporal hemianopsia, shape of fields simply represented, the left was taken with a candle. Drawn from memory. Tracing under R. E. inverted by mistake.

tion. Both optic nerves atrophic and devoid of capillarity. There was complete *bilateral temporal hemianopsia.*

The patient died, and at the post-mortem examination there was found a band-like gumma which stretched across the anterior end of the pons and reached to the cribriform space. One end of the tumor was thicker and heavier than the other. The corpora quadrigemina and optic tract, as well as the auditory nerve, were involved on one side. ("Nervous Diseases and their Diagnosis," H. C. Wood; p. 271.)

CASE III.—Ellen C., æt. 45. Presented herself last August in the Dispensary for Diseases of the Eye in the University Hospital to obtain an order for presbyopic glasses. Seven months prior to this date she had a partial

left-sided paralysis. Otherwise she had had no noticeable recent illness.

Examination.—The hemiplegia had passed away, although there was impaired muscular power upon that side of the body. The grip was weakened, as tested with the hand, and in walking it was noticed that she "favored" the left leg. There was no demonstrable anæsthesia. The left breast was invaded by a large, painless growth (cystosarcoma?). No cardiac murmurs were detected, but the aortic valves closed with a metallic snap. Vision in each eye $\frac{20}{XXV}$ and with suitable presbyopic glasses she read easily. With the exception of breadthening of the scleral

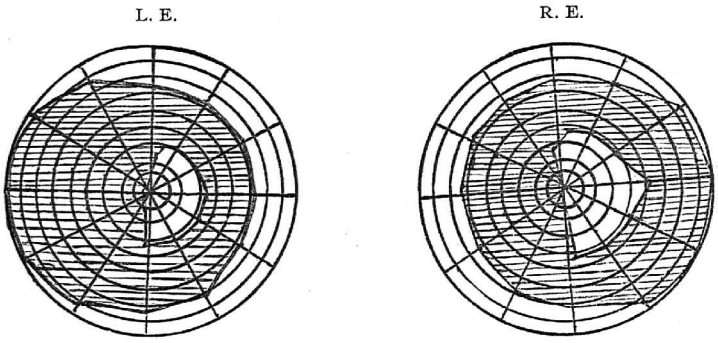

FIG. 3, CASE III.—Left lateral hemianopsia. The outer boundary of the shading represents the limits of the normal fields and the shading the areas where vision was lost.

rings, there were no changes in the optic nerves. The central circulation was normal, the choroid vessels were exposed on the periphery. There was *left lateral hemianopsia* and constriction of the preserved fields, this constriction being the most marked in the left eye. The dividing line passed almost through the fixing point, but sloped slightly above and below. She was practically unconscious of the visual defect, although on questioning she mentioned "that sometimes when sewing the thread looked as if it had been cut in half."

Diagnosis.—A lesion situated in the inferior parietal lobule and angular gyrus may perhaps explain this case, and it would then belong to the class of cases explained

by No. 6 of Seguin's rules. It is interesting to note the fact that the patient had a morbid growth of the breast, although I am inclined to think a hemorrhage in the region named or else in the occipital lobe was the lesion.

CASE IV.—Henry J. McG., æt. 49. A patient under the care of Dr. H. C. Wood in the University Hospital. Has had syphilis and been a hard drinker. In 1878, after a sleepy feeling, awoke, and found he had lost his memory for words, and forgotten French and German, with which languages he had previously been conversant. He had partially lost control of his *right* side. Treatment with iodide of potash produced marked improvement, and he

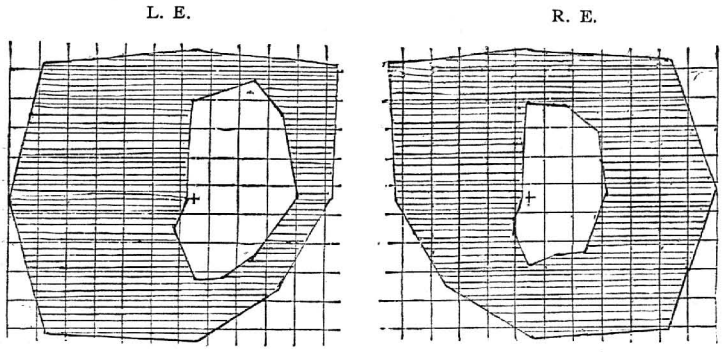

FIG. 4, CASE IV.—Left lateral hemianopsia. Fields taken on a ruled blackboard. The outer limits of the shading represent the boundaries of the fields assumed to be normal, the shading the areas of lost vision.

remained under treatment for two years. April 25th, 1886, while at dinner, a feeling like sea-sickness came over him, followed by maniacal excitement and loss of power on *left* side of his body, so that he was unable to walk or stand alone.

Examination.—April 29th, 1886. The memory for words was poor, but chose such words which in sound resembled those he desired to enunciate; thus he said "struck" for "stroke," "intelligently" for "intentionally." Face was drawn to the right side, the limbs were rigid and movements exaggerated. The patellar reflexes were increased, especially on the left side. There was no ankle

clonus. Felt the prick of a pin at any point in the arms and legs, but could not distinguish two points in the longitudinal axes of arms or legs, even when many inches apart, five on the forearm and nine on the leg. June 1st, 1886, examination of eyes. Vision in R. E. $\frac{20}{xxx}$ ($\frac{2}{3}$); in left eye $\frac{20}{L}$ ($\frac{1}{2}$). Nerves gray and horizontally oval. Retina hazy. *Left lateral hemianopsia*, with some contraction of the remaining fields. The dividing line was slightly in advance, *i. e.*, to the left of fixation, and just below the horizontal plane in each eye bent into an abrupt angle. The pupils were normal in their reactions to light and shade and to convergence, and were of equal size. November 30th, 1886. Has been able to walk alone; the gait was spastic and somewhat ataxic. February 10th, 1887. Eye examination was repeated and fields and appearances of the optic discs found to be the same as they were at the original examination.

Diagnosis.—The presence of lateral hemianopsia, hemiplegia (spastic after a time), and aphasia would naturally associate the lesion in this case with the motor zone and the convolutions at the end of the Sylvian fissure as in case by Westphal (Case 26, Seguin's list). But the clinical history shows that there were two attacks of hemiplegia, eight years apart, in the first of which there was right-sided palsy and aphasia, and in the second of which there was left-sided paralysis. It was only after the second attack that the eyes were examined, and the hemianopsia then found to be left lateral, and consequently it must have been the result of the second attack.

CASE V.—W. S., æt. 29. A patient under the care of Dr. H. C. Wood in the Nervous Wards of the University Hospital. He was well until his twenty-first year, when he began to have asthma. About ten months before admission began to be morbidly sleepy, and one month after this had a convulsion, during which, according to the statement of his wife, he "worked all over." He had a number of similar attacks until September, 1886, when, following such a seizure, he became irrational and violent, remaining so for twenty-four hours. During

the preceding April had an attack, when the convulsive movements began on the right side (leg and arm), and after this the right side was paralyzed for a number of hours. Denied syphilis. Patellar reflexes absent.

Examination.—Right pupil slightly larger than left. Both react to convergence, but not to light. There was constantly present an irregular tremor or chorea of the right arm and sometimes of the right leg, *rarely* in the left leg. The speech was slow and hesitating, the memory impaired. His vision was, O. D. $\frac{20}{xxv}$, O. S. $\frac{20}{xx}$; optic nerves gray-red; edges obscured; veins full and tortuous. The *left fields* were dark, the right fields much

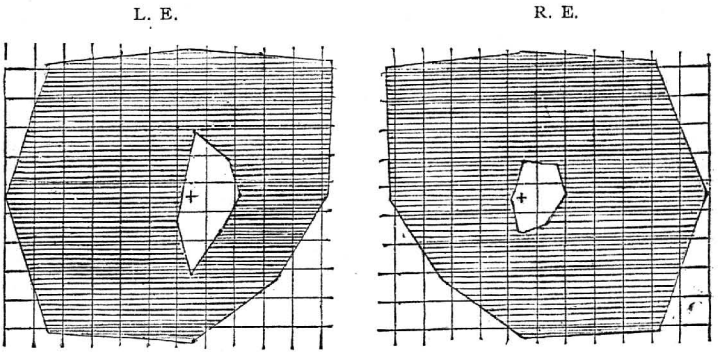

FIG. 5, CASE V.—Left lateral hemianopsia. The tracings and shading as in the other diagrams. Marked contraction of the visual field.

contracted, most markedly on the right side. The dividing line was irregular, passing distinctly in advance of the fixing point. After a course of mercurials, he improved somewhat, but reported occasional fits, usually right-sided, but occasionally left-sided. This improvement continued until November, 1886, when he grew worse. The seizures appeared with increased frequency, he became noisy and restless at night; the muscles of the face constantly twitched. He was often observed to masturbate. The urine had a specific gravity of 1.020, was slightly albuminous, but there was no sugar present. The sediment contained oxalate of lime crystals and spermatozoids. At times he exhibited typical delirium of gran-

deur. Finally he became so violent that it was necessary to send him to an asylum.

Diagnosis.—It seems quite evident from the history that no single lesion in this case produced the symptoms, and, moreover, that there was an affection of the cord as well as of the brain. It is most probable that a deposit, probably syphilitic meningitis, pressed upon the right optic tract, paralyzing the right temporal and the left nasal retina. This becomes the more assured when it is remembered that there were optic neuritis and pupillary immobility.

CASE VI.—John G——, æt 40. A patient of Dr. Osler, referred to me for examination. During the war sustained

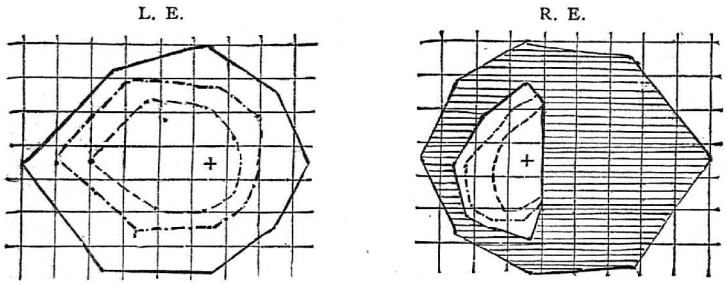

FIG. 6, CASE VI.—Unilateral temporal hemianopsia. Fields of vision for white, blue, and red. The shading in the left field represents where vision was wanting.

a fracture of the skull in the region of the left parietal bone.

Examination.—In the region of this bone, a distinct depression was observed. He was somewhat dull of comprehension, and subject to attacks of epilepsy. Pupils equal and normal. Vision O. D. $\frac{20}{XV}$, O. S. $\frac{20}{XX}$. The field of vision for form and colors in the right eye about normal. In the left eye, the larger part of the temporal field was dark. The dividing line passed to the left of fixation in a straight line. There were no abnormalities in the eye-grounds. The scleral rings on both sides were broadened.

Diagnosis.—It seems not improbable that this case was the result of the fracture which may have injured the bones of the orbit and the fibres of the left optic nerve

which pass to the nasal half of the retina. Dr. C. S. Bull (Trans. Ophthalmological Soc., 1885) has reported a very similar case.

CASE VII.—Mrs. L. W., æt. 37. Patient referred to Dr. Randall for examination in November 1886, and two months later examined by myself at the University Hospital. Recent general health has been poor, frequent right-sided neuralgia and "stomach trouble," both of which, however, improved under treatment. Has had five children (two husbands), all healthy, youngest twenty months old. Eighteen months after birth of fourth child, four years ago, was seized with temporary right-sided hemiple-

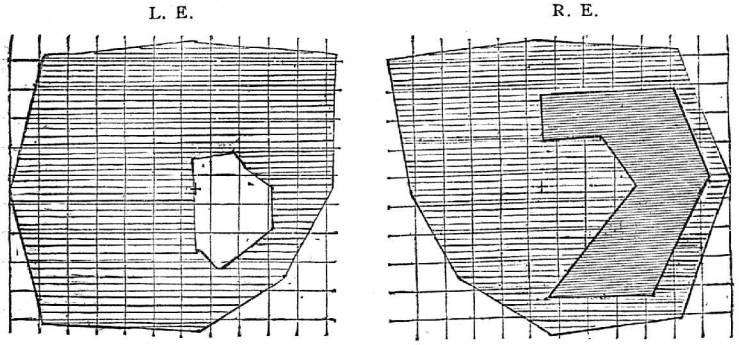

FIG. 7, CASE VII.—Temporal hemianopsia in L. E. In R. E. complete blindness, except an irregular patch of faint light perception in the right field, represented in diagram by the close shading ; the light shading represents where vision was lost.

gia, which passed away under use of electricity. Twice since then has had attacks of unconsciousness, followed by convulsions.

Examination.—Small woman, of rather ruddy complexion, which in the cold turned blue. Cardiac palpitation was easily induced, and there was a soft basal murmur. The muscular power of right side was impaired, but there was no palsy. The tongue was tremulous and turned to the left side. The patellar reflexes were prompt, more so on the left side. The left hand was colder to the touch than the right, and pain from prick of pin was said to be the more readily appreciated on the right side, but the opposite side was not anæsthetic. Pupils unequal, larger on the right

side. Vision in O. D. absent, possibly faint quantitative perception of light; in the left $\frac{20}{xxx}$ ($\frac{2}{3}$). Optic discs oval, shelving excavations, full and tortuous retinal vessels. The appearances on both sides almost identical. In the right eye no field even for light, except a patch on the temporal side where the light was doubtfully perceived. In the left there was total, left (temporal) hemianopsia, the dividing line passed directly through the fixing point and did not incline either above or below it.

Diagnosis.—Dr. Gowers ("Med. Ophthalmoscopy," 2d Ed., Case 30, p. 311) records the case of a boy who, one year after a fracture of the skull, suddenly had a fit, after which the left side became paralyzed, the left eye blind, and there was loss of the left half of the field of vision in the right eye. The case did not terminate fatally, but in commenting upon it, Dr. Gowers says: "The only theory on which the affection of sight can be explained is that of Charcot, which supposes the semi-decussation in the chiasma to be supplemented by another farther back, so that each eye becomes represented in the opposite hemisphere, although only half of each eye is represented in each optic tract. Charcot's theory is still an hypothesis only, but it is noteworthy that on this theory a lesion about the right corpora geniculata, so extensive as to destroy the fibres which come from the right optic tract (and the right halves of each retina=left halves of the fields), and also to destroy the decussating fibres supposed to come by the corpora quadrigemina from the left optic tract, would give precisely the condition present in this case, the only optic fibres undestroyed being those from the inner half of the right retina (outer half of the field) which pass by the left optic tract to the left hemisphere . . . A lesion so placed as to explain these (the cerebral symptoms) would probably involve or be beneath the lower part of the parietal lobe and angular gyrus." Charcot's theory and diagram are now quite universally rejected, I believe; but even were they proven to be correct, and were we to reason for this case as Dr. Gowers did for his, substituting for the word *left* the word *right*,

the explanation would not suffice. In his case there was left hemiplegia, left amblyopia, and loss of vision in the left half of the field of the right eye; hence, Charcot's theory being accepted, his reasoning as to the seat of the lesion is most accurate. In this case, however, there was right hemiplegia (partial), right amblyopia, but loss of vision in *left* half of the field of vision of the right eye, and not in right half of the field, as it would have to be were we to similarly place the lesion. On the other hand, a lesion so situated at the chiasma that it had destroyed all the fibres of the right optic nerve and damaged the inner half of the left, thus paralyzing the nasal half of left retina, making dark the temporal half of the field, would exactly explain the affection of sight. Whether a lesion so situated would also explain the cerebral symptoms I am in doubt, as I am also in doubt as to what the nature of such a lesion would be. Hysteria, as a possible causative factor, has been thought of, but this case does not correspond in its features to one of hysterical amblyopia.

CASE VIII.—John F., æt. about 30, a patient under the care of Dr. H. C. Wood, both in the Philadelphia and University Hospitals. I am unfortunately unable to give any detailed history, as the notes have been mislaid.

Examination.—Complete right-sided hemiplegia, hemianæsthesia, and aphasia. R. E. vision 0. In L. E. $\frac{20}{xxx}$. Right optic nerve gray-green, arteries small, veins full and tortuous, scleral ring breadthened all around. In L. E., small nerve, with breadthened scleral ring, edges of disc slightly hazy. Veins full and tortuous. There was apparently lateral hemianopsia; the field in the right eye was taken with a candle. It was then thought that either there was a double lesion or that a large clot in the lenticular nucleus might by pressure paralyze on one side Broca's convolution, and on the other the knee of the internal capsule. I repeated the examination in this case this winter, about eight months after the original examination, and then found vision in R. E. 0, in L. E. $\frac{20}{L^{r}}$. The fields were as in the diagrams, viz., in the R. E. absolutely dark, and in the L. E. only a small irregular

patch of preserved vision on the temporal side. I am inclined hence to think that there was no hemianopsia in this case, but that there were markedly irregular fields, as in neuritis; that the condition of the optic nerves was one of consecutive atrophy, the neuritis having entirely subsided in the R. E., and the atrophy become complete, while in the L. E. the process was not so far advanced, but that it will go on and the man will eventually become blind. This case was demonstrated by Dr. Wood before the Philadelphia County Medical Society, and has also furnished the material for one of his clinical demonstrations before the medical class of the University.

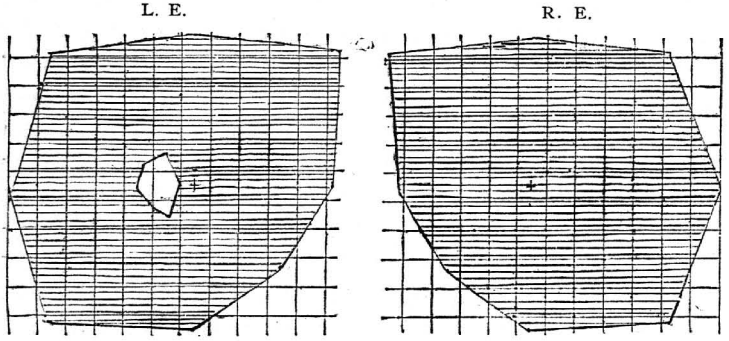

FIG. 8, Case VIII.—R. E. complete loss of vision, field entirely dark. L. E. small area of preserved field on the temporal side. Shading represents areas of lost vision, and the limits of the shading the boundaries of the fields assumed to be normal.

I will call attention to the following points:

1. The optic nerves were atrophic in the two cases of bitemporal hemianopsia, and there was slight but well-marked optic neuritis in one of the cases of left lateral hemianopsia (Case V.). In these cases the lesion was quite certainly at the base of the brain. There were no changes in the fundus in one of the cases of lateral hemianopsia, in the remaining one the optic nerves were gray, but there was fairly good central vision. In the case of so-called unilateral temporal hemianopsia, there were no fundus changes, and central vision was normal.

2. In no case was the hemiopic pupillary reaction observed.

3. In all the cases the dividing line passed with some irregularity, *i. e.*, slightly in advance of the fixing point, with the single exception of Case VII., where it passed directly through the fixing point.

4. One patient (Case III.) was practically unconscious of the visual defect.